

Claims

1. An antibody that is reactive with an extracellular loop(s) of C5aR other than the N-terminal domain, wherein the antibody reduces or inhibits the binding of C5a to C5aR.
2. An antibody according to claim 1, wherein the antibody is reactive with an epitope comprising the second extracellular loop (residues 175 to 206) of C5aR.
3. An antibody that is reactive with the same epitope of C5aR as MAb 7F3, wherein the antibody reduces or inhibits the binding of C5a to C5aR.
4. An antibody that is reactive with the same epitope of C5aR as MAb 6C12, wherein the antibody reduces or inhibits the binding of C5a to C5aR.
5. An antibody that is reactive with the same epitope of C5aR as MAb 12D4, wherein the antibody reduces or inhibits the binding of C5a to C5aR.
6. An antibody that binds to C5aR, wherein the antibody competitively inhibits the binding of MAb 7F3 to C5aR.
7. An antibody that binds to C5aR, wherein the antibody competitively inhibits the binding of MAb 6C12 to C5aR.
8. An antibody that binds to C5aR, wherein the antibody competitively inhibits the binding of MAb 12D4 to C5aR.
9. An antibody according to any one of claims 6 to 8, wherein the comparative binding specificity is determined by antibody-antibody competition assays in the presence of C5aR or a polypeptide comprising an extracellular loop of C5aR.
10. An antibody comprising substantially the same light and/or heavy chain sequences as shown in SEQ ID NO:19 and SEQ ID NO:21 respectively, wherein the antibody reduces or inhibits the binding of C5a to C5aR.

11. An antibody comprising at least one CDR loop sequence which is substantially the same as a variable heavy chain CDR1, CDR2 or CDR3 loop sequence as shown in SEQ ID NO:26, SEQ ID NO:27 or SEQ ID NO:28 respectively, wherein the antibody reduces or inhibits the binding of C5a to C5aR.
- 5 12. An antibody according to claim 11, wherein the antibody comprises at least two CDR loop sequences which are substantially the same as the variable heavy chain CDR1, CDR2 or CDR3 loop sequences shown in SEQ ID NO:26, SEQ ID NO:27 and SEQ ID NO:28 respectively.
- 10 13. An antibody according to claim 11 or claim 12, wherein the antibody further comprises at least one CDR loop sequence substantially as defined by amino acid residues 24 to 39, 55 to 61 or 94 to 102 of the variable light chain sequence shown in SEQ ID NO:19.
- 15 14. An antibody according to claim 13, wherein the antibody comprises at least two CDR loop sequences substantially as defined by amino acid residues 24 to 39, 55 to 61 and 94 to 102 of the variable light chain sequence shown in SEQ ID NO:19.
- 20 15. An antibody comprising substantially the same light and/or heavy chain sequences as shown in SEQ ID NO:15 and SEQ ID NO:17 respectively, wherein the antibody reduces or inhibits the binding of C5a to C5aR.
- 25 16. An antibody comprising at least one CDR loop sequence which is substantially the same as a variable heavy chain CDR1, CDR2 or CDR3 loop sequence as shown in SEQ ID NO:29, SEQ ID NO:30 or SEQ ID NO:31 respectively, wherein the antibody reduces or inhibits the binding of C5a to C5aR.
- 30 17. An antibody according to claim 16, wherein the antibody comprises at least two CDR loop sequences which are substantially the same as the variable heavy chain CDR1, CDR2 or CDR3 loop sequences shown in SEQ ID NO:29, SEQ ID NO:30 and SEQ ID NO:31 respectively.
- 35 18. An antibody according to claim 16 or claim 17, wherein the antibody further comprises at least one CDR loop sequence substantially as defined by amino acid

residues 24 to 39, 55 to 61 or 94 to 102 of the variable light chain sequence shown in SEQ ID NO:15.

19. An antibody according to claim 18, wherein the antibody comprises at least two CDR loop sequences substantially as defined by amino acid residues 24 to 39, 55 to 61 and 94 to 102 of the variable light chain sequence shown in SEQ ID NO:15.

20. An antibody comprising substantially the same light and/or heavy chain sequences as shown in SEQ ID NO:23 and SEQ ID NO:25 respectively, wherein the antibody reduces or inhibits the binding of C5a to C5aR.

21. An antibody comprising at least one CDR loop sequence which is substantially the same as a variable heavy chain CDR1, CDR2 or CDR3 loop sequence as shown in SEQ ID NO:32, SEQ ID NO:33 or SEQ ID NO:34 respectively, wherein the antibody reduces or inhibits the binding of C5a to C5aR.

22. An antibody according to claim 21, wherein the antibody comprises at least two CDR loop sequences which are substantially the same as the variable heavy chain CDR1, CDR2 or CDR3 loop sequences shown in SEQ ID NO:32, SEQ ID NO:33 and SEQ ID NO:34 respectively.

23. An antibody according to claim 21 or claim 22, wherein the antibody further comprises at least one CDR loop sequence substantially as defined by amino acid residues 24 to 39, 55 to 61 or 94 to 102 of the variable light chain sequence shown in SEQ ID NO:23.

24. An antibody according to claim 23, wherein the antibody comprises at least two CDR loop sequences substantially as defined by amino acid residues 24 to 39, 55 to 61 and 94 to 102 of the variable light chain sequence shown in SEQ ID NO:23.

25. An antibody according to any one of claims 1 to 24, wherein the antibody also inhibits activation of neutrophils by a chemoattractant ligand other than C5a.

26. An antibody according to any one of claims 1 to 25, wherein the antibody is a monoclonal or recombinant antibody.

27. An antibody according to any one of claims 1 to 25, wherein the antibody is a chimeric antibody or a humanized antibody.
28. An antibody according to any one of claims 1 to 27, wherein the antibody is a class IgG2a or class IgG3 antibody.
29. A monoclonal antibody selected from the group consisting of MAb 7F3, MAb 6C12 and MAb 12D4.
30. A hybridoma as deposited with ECACC under accession number 00110609.
31. A hybridoma as deposited with ECACC under accession number 02090226.
32. A hybridoma as deposited with ECACC under accession number 02090227.
33. A conjugate comprising an antibody of any one of claims 1 to 29 and a therapeutic agent.
34. A conjugate according to claim 33, wherein the therapeutic agent is a toxin.
35. A conjugate according to claim 33, wherein the toxin is a *Pseudomonas* exotoxin or a derivative thereof.
36. A conjugate comprising an antibody of any one of claims 1 to 29 and a detectable label.
37. A conjugate according to claim 36, wherein the label is selected from the group consisting of a radiolabel, a fluorescent label, an enzymatic label and contrast media.
38. An isolated nucleic acid molecule, the nucleic acid molecule comprising a sequence encoding an antibody of any one of claims 1 to 29.
39. A composition comprising a antibody according to any one of claims 1 to 29 and a pharmaceutically acceptable carrier.

40. A method for inhibiting the interaction of a cell bearing C5aR with a ligand thereof, the method comprising exposing the cell to an antibody of any one of claims 1 to 29.
- 5 41. A method for inhibiting C5aR activity in a cell, the method comprising exposing the cell to an antibody of any one of claims 1 to 29.
42. A method of treating a disorder involving neutrophil migration in a subject, the method comprising administering to the subject an antibody of any one of claims 1 to 29.
- 10 43. A method for diagnosing a disorder involving neutrophil migration in a subject, the method comprising contacting a sample obtained from the subject with a conjugate of claim 36 or claim 37, and detecting immunospecific binding between the conjugate and the sample.
- 15 44. A method according to claim 43, wherein the method is performed *in vitro* using histological specimens or subfractions of tissue or fluid obtained from the subject.
- 20 45. A method according to claim 43, wherein the method is performed *in vivo*.
46. A method for diagnosing a disorder involving neutrophil migration in a subject, the method comprising administering to the subject an antibody of any one of claims 1 to 19 labeled with an imaging agent under conditions so as to form a complex between the antibody and cells presenting C5aR in the subject, and imaging the complex.
- 25 47. A method according to any one of claims 42 to 46, wherein the disorder is an immunopathological disorder.
- 30 48. A method for delivering a therapeutic agent to a site of inflammation in a subject, the method comprising administering to the subject a conjugate of any one of claims 33 to 35.
- 35 49. A method for introducing genetic material into cells presenting C5aR, the method comprising contacting the cells with an antibody of any one of claims 1 to 29, wherein the antibody is attached to or associated with genetic material.

50. A method according to claim 49, wherein the cells presenting C5aR are selected from the group consisting of granulocytes, leukocytes, such as monocytes, macrophages, basophils and eosinophils, mast cells and lymphocytes including T cells,  
5 dendritic cells, and non-myeloid cells such as endothelial cells and smooth muscle cells.

51. A method of treating a disorder involving neutrophil migration in a subject, the method comprising introducing into cells of the subject a polynucleotide encoding an antibody according to any one of claims 1 to 29 such that the antibody is expressed *in*  
10 *vivo*.